WHAT IS CLAIMED IS:

1          1.    A vehicle-based programmable appliance control system

2    comprising:

3          a vehicle-based data communication bus;

4          at least one user activation input;

5          a bus interface transmitting an activation input signal over the data

6    communication bus based on assertion of the at least one user activation input;

7          a radio frequency transmitter remotely located from the at least one

8    user activation input; and

9          control logic in communication with the at least one user activation

10    input and the transmitter, the control logic operative to generate control signals for

11    transmitting an appliance activation signal based on receiving transmission of the

12    activation input signal.

1          2.    The system of claim 1 further comprising at least one user

2    indicator remotely located from the transmitter, the control logic further operative to

3    activate the user indicator over the data communication bus.

1          3.    The system of claim 2 wherein the user indicator is at least one

2    indicator lamp.

1          4.    The system of claim 2 wherein the user indicator is a graphical

2    display.

1          5.    The system of claim 2 wherein the user indicator generates an

2    audible sound.

1          6.    The system of claim 1 wherein the at least one activation input

2    comprises a plurality of switches.

1          7.    The system of claim 1 wherein the at least one activation input

2    comprises a voice recognizer.

1        8.    The system of claim 1 wherein the at least one activation input

2  comprises at least one display control.

1        9.    The system of claim 1 further comprising a memory in

2  communication with the control logic, the memory holding a plurality of activation

3  schemes, each activation scheme providing characteristics for generating at least one

4  appliance activation signal.

1        10.    The system of claim 9 further comprising a data port in

2  communication with the control logic over the data communication bus, the control

3  logic operative to receive data from the data port modifying the plurality of activation

4  schemes.

1        11.    A method of activating a remotely controlled appliance

2  comprising:

3        receiving an activation input from a user;

4        transmitting an input signal representing the activation input through

5  a vehicle-based communication bus;

6        receiving the input signal from the vehicle-based bus at a location

7  remote from where the activation input was received; and

8        transmitting a radio frequency activation signal based on the received

9  input signal.

1        12.    A method of programming a vehicle-based remote control, the

2  remote control operative to transmit at least one activation signal for activating a

3  remotely controlled appliance, the method comprising:

4        receiving at least one programming input from a user, the

5  programming input specifying at least one of a plurality of activation signal

6  characteristics;

7        transmitting at least one programming signal representing the at least

8  one programming input through a vehicle-based communication bus;

9           receiving the at least one programming signal from the vehicle-based

10    bus at a location remote from where the at least one programming input was received;

11    and

12           transmitting a radio frequency activation signal based on the at least one

13    programming signal.


1           13.    The method of claim 12 wherein the at least one programming

2    input comprises a fixed code value.


1           14.    The method of claim 12 wherein the at least one programming

2    input comprises a selection of one of a plurality of activation transmission schemes.


1           15.    The method of claim 12 wherein the at least one programming

2    input comprises an indication of whether the remotely controlled appliance is

3    responsive to a fixed code activation signal or to a rolling code activation signal.


1           16.    A vehicle-based remote garage door opener comprising

2           a vehicle-based bus running throughout at least a portion of an

3    automotive vehicle;

4           at least one user input device in communication with the vehicle-based

5    bus;

6           a radio frequency transmitter operative to transmit at least one of a

7    plurality of different activation signals; and

8           control logic in communication with the vehicle-based bus and the

9    transmitter, the control logic remotely located from the at least one user input device,

10    the control logic commanding the transmitter to transmit at least one activation signal

11    based on input received over the vehicle-based bus from the at least one user input

12    device.


1           17.    The vehicle-based remote garage door opener of claim 16

2    wherein the at least one user input device is a plurality of switches, each of which

3    provides an activation input.

1        18.    The vehicle-based remote garage door opener of claim 16
2  wherein the control logic receives a fixed code value from the at least one user input
3  device.

1        19.    The vehicle-based remote garage door opener of claim 16
2  wherein the control logic receives a selection signal from the at least one user input
3  device, the selection signal selecting at least one of a plurality of possible activation
4  signal transmission schemes.

1        20.    The vehicle-based remote garage door opener of claim 19
2  wherein the control logic receive the selection signal in response to at least one test
3  activation signal sent by the transmitter.

1        21.    The vehicle-based remote garage door opener of claim 16
2  further comprising a memory storing a plurality of activation signal transmission
3  schemes.

1        22.    The vehicle-based remote garage door opener of claim 21
2  further comprising a data port in communication with the vehicle-based bus, the data
3  port receiving changes to the plurality of activation signal transmission schemes and
4  forwarding the received changes to the memory.

1        23.    The vehicle-based remote garage door opener of claim 16
2  further comprising at least one user output device in communication with the vehicle-
3  based bus.

1        24.    A programmable control for an appliance, the appliance
2  responding to one of a plurality of transmission schemes, the programmable control
3  comprising:
4          a serial data communication bus;
5          a transmitter operative to transmit a radio frequency activation signal
6  based on any of the plurality of transmission schemes;
7          a user programming input; and

8    control logic in communication with the user programming input

9    through the serial data communication bus, the control logic implementing a rolling

10    code programming mode, a fixed code programming mode and an operating mode,

11    the control logic in rolling code programming mode generating and transmitting a

12    sequence of rolling code activation signals until user input indicates a successful

13    rolling code transmission scheme, the control logic in fixed code programming mode

14    receiving a fixed code from the user programming input then generating and

15    transmitting a sequence of fixed code activation signals until user input indicates a

16    successful fixed code transmission scheme.

1    25.   A programmable control for an appliance, the appliance

2    responding to one of a plurality of transmission schemes, the programmable control

3    comprising:

4    a serial data communication bus;

5    a transmitter operative to transmit a radio frequency activation signal;

6    a programming input;

7    memory holding data describing a plurality of rolling code transmission

8    schemes associated with a rolling code mode and a plurality of fixed code transmission

9    schemes, at least one fixed code transmission scheme associated with each of at least

10    one fixed code mode; and

11    control logic in communication with the programming input over the

12    serial data communication bus, for each of at least one channel the control logic

13    maintaining a channel mode set initially to the rolling code mode, the channel mode

14    changing to one of the at least one fixed code mode if the channel is trained to a fixed

15    code received from the programming input.

1    26.   A programmable control for an appliance, the appliance

2    responding to one of a plurality of transmission schemes, the programmable control

3    comprising:

4    a serial data communication bus;

5    a transmitter operative to transmit a radio frequency activation signal;

6    a plurality of activation inputs, each generating an activation signal

7    when asserted;

8          memory holding data describing each of the plurality of transmission

9    schemes; and

10         control logic in communication with the activation inputs over the serial

11    data communication bus, the control logic programmed to associate each of the

12    plurality of activation inputs with at least one of the plurality of transmissions schemes,

13    the control logic generating and transmitting an activation signal based on each of the

14    at least one associated transmission scheme in response to receiving an activation

15    signal from an asserted activation input over the serial data communication bus.